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EXAMINER

MOORE, PATRICK M

ART UNIT	PAPER NUMBER
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2188

DATE MAILED: 12/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/698,728	Applicant(s) SEIDI ET AL.	
	Examiner Patrick M. Moore	Art Unit 2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-21 have been examined.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 6-14 & 16-21 rejected under 35 U.S.C. 102(b) as being anticipated by Nguyen et al. (US Patent # 5,887,275), herein referred to as Nguyen.
 - a. As per Claim 1, Nguyen discloses a method for accessing objects stored outside of main memory in an object-addressed memory hierarchy, comprising: receiving a request to access an object, wherein the request includes an object identifier for the object that is used to reference the object within the object-addressed memory hierarchy [Column 3, Lines 43-55]; using the object identifier to retrieve an object table entry associated with the object [Figure 7, # 704, 706 & Column 10, Lines 33-39]; examining a valid indicator within the object table entry [Figure 6, # 622 & Column 7, Lines 32-35]; if the valid indicator indicates the object is located in main memory, using a physical address in the object table entry to access the object in main memory [Figure 7, # 700, 716, 718, 714 & Column 10, Lines 47-56]; and if the valid indicator indicates that the object is not located in main memory, relocating the object into memory from a location outside of memory, and then accessing the object in main memory [Figure 6,

#610 & Column 9, Lines 36-49]. Examiner understands the combination of the “pseudo-timestamp” [per Column 7, Lines 32-35] and setting the Virtual Memory Address to NULL [per Column 6, Lines 16-28] provide indication as to whether the referenced object is stored in main memory or not stored in main memory.

b. As per Claim 2, Nguyen further discloses the method of claim 1, wherein the request to access the object is received at a translator that translates between object identifiers (used to reference objects in an object cache) and physical addresses (used to address objects in main memory) [Figure 7, # 708, 710 & Column 7, Lines 64-67 and Column 8, Lines 1-9].

c. As per Claim 3, Nguyen further discloses the method of claim 2, wherein prior to receiving the request at the translator, the request is initially directed to the object cache [Figure 7, # 700]; wherein if the request causes a hit in the object cache, the object is accessed in the object cache and the request is not sent to the translator [Figure 7, “No” branch of # 700, 716, 718 & 714]; and wherein if the request causes a miss in the object cache, the request is sent to the translator [Figure 7, “Yes” branch of # 700, 702 & Column 10, Lines 20-36].

d. As per Claim 4, Nguyen further discloses the method of claim 1, wherein relocating the object into main memory involves using location information from the object table entry to determine the location of the object outside of main memory [Figure 7, # 704 & Column 10, Lines 33-39].

- e. As per Claim 6, Nguyen further discloses the method of claim 4, wherein the location information is overloaded into a physical address field in the object table entry [Figure 7, # 704 and Figure 2, # 210].
- f. As per Claim 7, Nguyen further discloses the method of claim 1, wherein relocating the object into main memory involves causing an object fault handler to execute in a central processing unit (CPU) to relocate the object into main memory [Column 2, Lines 44-46]. Examiner understands the disclosed "DBMS" to be one such object fault handler.
- g. As per Claim 8, Nguyen further discloses the method of claim 1, wherein relocating the object into main memory involves overlapping retrieval of multiple objects into main memory from locations outside of main memory [Figure 6, # 606, 608, 610 & Column 9, Lines 41-44].
- h. As per Claim 9, Nguyen further discloses the method of claim 1, wherein after relocating the object into main memory, the method further comprises: updating the valid indicator to specify that the object is located in main memory [Figure 7, #712]; and updating the physical address in the object table entry to specify the location of the object in main memory [Figure 7, # 710 & Column 10, Lines 33-46].
- i. As per Claim 10, Nguyen further discloses the method of claim 1, wherein the object is defined within an object-oriented programming system [Column 3, Lines 43-55]. As would be known to one of ordinary skill in the art, the language of

Column 3, more specifically Lines 33-46, teaches that an object oriented programming system was used to obtain the invention as disclosed by Nguyen.

j. As per Claim 11, Nguyen discloses an apparatus that facilitates accessing objects stored outside of main memory in an object-addressed memory hierarchy, comprising: a receiving mechanism configured to receive a request to access an object, wherein the request includes an object identifier for the object that is used to reference the object within the object-addressed memory hierarchy [Column 3, Lines 43-55]; a object table lookup mechanism configured to use the object identifier to retrieve an object table entry associated with the object [Figure 7, # 704, 706 & Column 10, Lines 33-39]; an access mechanism configured to, examine a valid indicator within the object table entry [Figure 6, # 622 & Column 7, Lines 32-35], if the valid indicator indicates the object is located in main memory, to use a physical address in the object table entry to access the object in main memory [Figure 7, # 700, 716, 718, 714 & Column 10, Lines 47-56], and if the valid indicator indicates that the object is not located in main memory, to relocate the object into memory from a location outside of memory, and to access the object in main memory [Figure 6, #610 & Column 9, Lines 36-49].

k. As per Claim 12, Nguyen further discloses the apparatus of claim 11, wherein the receiving mechanism is contained within a translator that translates between object identifiers (used to reference objects in an object cache) and physical

addresses (used to address objects in main memory) [Figure 7, # 708, 710 & Column 7, Lines 64-67 and Column 8, Lines 1-9].

l. As per Claim 13, Nguyen further discloses the apparatus of claim 12, further comprising the object cache, wherein prior to receiving the request at the translator, the request is initially directed to the object cache [Figure 7, # 700]; wherein if the request causes a hit in the object cache, the object is accessed in the object cache and the request is not sent to the translator [Figure 7, "No" branch of # 700, 716, 718 & 714]; and wherein if the request causes a miss in the object cache, the request is sent to the translator [Figure 7, "Yes" branch of # 700, 702 & Column 10, Lines 20-36].

m. As per Claim 14, Nguyen further discloses the apparatus of claim 11, wherein while relocating the object into main memory, the access mechanism is configured to use location information from the object table entry to determine the location of the object outside of main memory [Figure 7, # 704 & Column 10, Lines 33-39].

n. As per Claim 16, Nguyen further discloses the apparatus of claim 14, wherein the location information is overloaded into a physical address field in the object table entry [Figure 7, # 704 and Figure 2, # 210].

o. As per Claim 17, Nguyen further discloses the apparatus of claim 11, wherein while relocating the object into main memory, the access mechanism is configured to cause an object fault handler to execute in a central processing unit (CPU) to relocate the object into main memory [Column 2, Lines 44-46].

- p. As per Claim 18, Nguyen further discloses the apparatus of claim 11, wherein while relocating the object into main memory the access mechanism is configured to overlap retrieval of multiple objects into main memory from locations outside of main memory [Figure 6, # 606, 608, 610 & Column 9, Lines 41-44].
- q. As per Claim 19, Nguyen further discloses the apparatus of claim 11, wherein after relocating the object into main memory, the access mechanism is configured to: update the valid indicator to specify that the object is located in main memory [Figure 7, # 712]; and to update the physical address in the object table entry to specify the location of the object in main memory [Figure 7, # 710 & Column 10, Lines 33-46].
- r. As per Claim 20, Nguyen further discloses the apparatus of claim 11, wherein the object is defined within an object-oriented programming system [Column 3, Lines 43-55].
- s. As per Claim 21, Nguyen discloses the computer system that facilitates accessing objects stored outside of main memory in an object-addressed memory hierarchy, comprising: a processor [Figure 1, # 102]; a main memory [Figure 1, # 104]; the object-addressed memory hierarchy [Abstract, Lines 1-2 & Column 3, Lines 52-55]; an object cache within the object-addressed memory hierarchy [Figure 7, # 700 & Column 3, Lines 43-48]; a translator that translates between object identifiers, used to address objects in the object cache, and physical addresses, used to address objects in main memory [Figure 7, # 708,

710 & Column 7, Lines 64-67 and Column 8, Lines 1-9]; wherein the translator is configured to receive a request to access an object after the request misses in the object cache [Figure 7, "Yes" branch of # 700, 702 & Column 10, Lines 20-36], wherein the request includes an object identifier for the object that is used to reference the object within the object-addressed memory hierarchy [Column 3, Lines 43-55]; a object table lookup mechanism with the translator configured to use the object identifier to retrieve an object table entry associated with the object [Figure 7, # 704, 706 & Column 10, Lines 33-39]; and an access mechanism configured to, examine a valid indicator within the object table entry [Figure 6, # 622 & Column 7, Lines 32-35], if the valid indicator indicates the object is located in main memory, to use a physical address in the object table entry to access the object in main memory [Figure 7, # 700, 716, 718, 714 & Column 10, Lines 47-56], and if the valid indicator indicates that the object is not located in main memory, to relocate the object into memory from a location outside of memory, and to access the object in main memory [Figure 6, #610 & Column 9, Lines 36-49].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 5 & 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nguyen et al. (US Patent # 5,887,275) as applied to claims 1-4, 6-14 and 16-21 above, and further in view of Malcolm (US Patent # 6,427,187).

a. As per Claims 5 & 15, Nguyen discloses the method of claims 4 & 14, wherein the location information can include: a secondary storage address for the object [Figure 4, # 210, 202 & 208]; and another (possibly different) object identifier associated with the object [Figure 4, # 306, 302, 304 & 308]. Nguyen does not expressly disclose the location as a network address for the object; a uniform (or universal) resource locator (URL) for the object; and a physical address for a compressed block of objects containing the object.

b. However, Malcolm teaches loading "web objects" into the Cache System [Figure 1, # 110] of a Client/Server Devices in Column 3, Lines 10-19 and Lines 30-39. Additionally, Malcolm discloses that the location information can include a network address via a "LAN (Local Area Network)" [Column 4, Lines 6], a URL [Column 8, Lines 6-10] or a compressed block of data [Column 6, Lines 25-30 & Column 9, Lines 24-27]. Additionally, Nguyen and Malcolm are analogous art because they are from the same field of endeavor: object-oriented handling of data blocks in cache memory.

c. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the object-addressed cache as disclosed by Nguyen to use the inter-cache communication taught by Malcolm to obtain the invention as specified in Claims 5 and 15. The suggestion/motivation for doing

so would have been to maximize efficient data transfer, as taught by Malcolm [Column 1, Lines 33-36], in an object based caching system.


Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick M. Moore whose telephone number is (571) 272-1239. The examiner can normally be reached on M-F 8:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on (571) 272-4210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PMM


12/22/08
MANO PADMANABHAN
SUPERVISORY PATENT EXAMINER